

Permit Fact Sheet

General Information

Permit Number:	WI-0066664-01-0
Permittee Name:	Big River Resources LLC
Facility Name:	Big River Resources Boyceville LLC
Facility Address:	N10185 370 th St, Boyceville, WI 54725
Discharge Location:	N10185 370 th St, Boyceville, WI (NE ¼ SE ¼ of Section 29, T30N, R13W)
Receiving Water:	Outfall 001 and Outfall 002: The groundwater within the South Fork Hay River Watershed in the Lower Chippewa River Basin in Dunn County
StreamFlow (Q _{7,10}):	N/A
Stream Classification:	N/A

Facility Description

Big River Resources Boyceville, LLC (BRRB) is a fuel-grade ethanol production plant with the capacity to produce 70 million gallons per year of 200-proof ethanol and 181,731 tons per year (dry weight basis) of distiller dried grains with solubles. The facility also has the capacity to produce corn distillers oil from by-products of the ethanol production process. The process water used in the ethanol production comes from on-site private wells. The well water is treated with oxidation and green sand filters. The filtrate is then directed to a process water tank where it is either directed to the ethanol production process, to a reverse osmosis (RO) system for further water treatment, or to the fire suppression system. The RO permeate is either piped to water softeners or to be used as cooling water in the cooling tower system. The softened water is then used in the boiler system. The sand filter backwash (44,000 gpd) is conveyed to an iron settling pond to settle out the solids then is combined with RO reject water (44,000 gpd) and cooling tower blowdown (15,000 gpd) prior to discharging to the infiltration pond via Outfall 001. The softener regeneration water and boiler blowdown are reused in the ethanol production process. BRRB uses an on-site potable water well as source water for restrooms, washing stations, emergency showers, and other potable water uses. These domestic wastewater sources, excluding fire suppression water, are discharged to an on-site septic system that are regulated by Dunn County. The fire suppression system is inspected and flushed annually by a contractor and the water is discharged to the lawn and ground surface at the site. The ethanol production process does not generate any sludge or by-product solids that require disposal. Occasionally, BRRB will have the iron settling pond dredged to remove the accumulated sediment/sludge. The dredged sediment/sludge is dewatered on-site and the carriage water and/or interstitial water (pore water) is discharged back to the settling pond then ultimately conveyed to the infiltration pond via Outfall 001. The dredged sediment/sludge is hauled for off-site disposal. A facility site map and water flow diagram for the facility are attached to this fact sheet.

This is the first-time individual permit issuance for this facility site. Previously, the discharges from this facility were covered under the Non-Contact Cooling Water, or Condensate and Boiler Blowdown WPDES General Permit (No. WI-0044938), the Water Treatment and Conditioning WPDES General Permit (No. WI-0046540), and the Carriage and Interstitial Water from Dredging Operations WPDES General Permit (No. WI-0046558).

Fact Sheet Organization

This fact sheet serves to explain the rationale and assumptions used in deriving the conditions and requirements set forth in the permit. The sections that follow are taken from the permit and are numbered in this fact sheet as they are numbered in the permit.

1 Land Treatment Requirements

1.1 Sampling Points

The discharges shall be limited to the waste types designated for the listed sampling points.

Sampling Point Designation	
Sampling Point Number	Sampling Point Location, Waste Description/Sample Contents and Treatment Description (as applicable)
001	At Sampling Point 001, the permittee shall sample the combined discharge of sand filter backwash, reverse osmosis reject, cooling tower blowdown, carriage water and/or interstitial water discharge from occasional dredging of sediment from the on-site settling pond prior to discharging to the infiltration (absorption) pond system.
002	At Sampling Point 002, the permittee shall sample the flushing of the fire hydrants located at the site prior to discharging to the ground surface.

1.2 Monitoring Requirements and Limitations

The permittee shall comply with the following monitoring requirements and limitations.

1.2.1 Sampling Point (Outfall) 001 - Effluent to Infiltration Pond, Absorption Pond (Seepage Cell)

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		gpd	Daily	Total Daily	
pH Field		su	Quarterly	Grab	
Solids, Total Dissolved		mg/L	Quarterly	Grab	
Chloride		mg/L	Quarterly	Grab	
Nitrogen, Total Kjeldahl		mg/L	Quarterly	Grab	
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	Grab	
Nitrogen, Organic Total		mg/L	Quarterly	Calculated	
Nitrogen, Ammonia (NH ₃ -N) Total		mg/L	Quarterly	Grab	
Iron, Total Recoverable		ug/L	Quarterly	Grab	
Manganese, Total		ug/L	Quarterly	Grab	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Recoverable					
Arsenic, Total Recoverable		ug/L	Quarterly	Grab	
COD		mg/L	Quarterly	Grab	

Explanation of Limits and Monitoring Requirements

Flow Rate: In accordance with ss. NR 214.12(4)(a) and NR 214.12(5)(a), Wis. Adm. Code, the discharge to each absorption pond cell shall be monitored for total daily discharge volume and the absorption pond cells shall be loaded intermittently to allow sufficient resting periods to maintain the absorptive capacity of the soil. Therefore, the department has included total daily flow monitoring and hydraulic loading monitoring.

Monitoring Parameters: In accordance with s. NR 214.12(4)(b), Wis. Adm. Code, the department may require in a WPDES permit that the discharge be monitored for BOD₅, total suspended solids, forms of nitrogen, chloride, metals or any other pollutant that may be present. The department shall select the pollutants to be monitored and the required frequency of monitoring on a case-by-case basis by considering the potential public health impacts, probable environmental impact, soil and geologic conditions, past operating performance, concentrations and characteristics of pollutants in the discharge and other relevant information. Therefore, the department has included quarterly monitoring of the effluent for organic nitrogen, ammonia nitrogen, nitrate and nitrite nitrogen, TKN, chlorides, dissolved solids, field pH, COD, iron, manganese, and arsenic based on the monitoring data provided in the permit application, types of water treatment systems used at the facility, and plan submittal information for the system.

1.2.2 Sampling Point (Outfall) 002 - Fire Hydrant Flushing

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Volume		gal	Annual	Total Annual	

Explanation of Limits and Monitoring Requirements

Volume: The fire suppression water used at the site comes from water that was treated by oxidation and green sands filters that has been sourced from the process wells. BRRB typically tests the fire suppression system on an annual basis and discharges the water to the ground surface. Therefore, volume monitoring is only required to track the total annual volume of fire suppression water discharged from flushing hydrants at the site.

Erosion and Runoff Control: This practice was added to control the discharge to prevent erosion and runoff from the site so that the discharge does not enter surface water.

Visual Inspection Log: Visual inspections and a record of these inspections in a log of the discharge will allow the permittee to assess if the discharge will cause any pollution or runoff from the site. If the permittee observes any indicators of pollution, then the discharge shall cease until the pollution is removed.

2 Groundwater Requirements

2.1 Monitoring Requirements and Limitations

2.1.1 Groundwater Monitoring System for Infiltration Pond System Site

Location of Monitoring system: TBD

Wells to be Monitored: MW-1, MW-2, MW-3

Well Used To Calculate PALs: TBD

Enforcement Standard Wells: TBD

Parameter	Units	Preventative Action Limit	Enforcement Standard	Frequency
Depth To Groundwater	feet	*****	N/A	Quarterly
Groundwater Elevation	feet MSL	*****	N/A	Quarterly
pH Field	su	*****	N/A	Quarterly
Solids, Total Dissolved	mg/L	*****	N/A	Quarterly
Chloride Dissolved	mg/L	125	250	Quarterly
Nitrogen, Total Kjeldahl Dissolved	mg/L	*****	N/A	Quarterly
Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	2.0	10	Quarterly
Nitrogen, Organic Dissolved	mg/L	*****	N/A	Quarterly
Nitrogen, Ammonia Dissolved	mg/L	0.97	9.7	Quarterly
Iron Dissolved	ug/L	150	300	Quarterly
Manganese Dissolved	ug/L	60	300	Quarterly
Arsenic Dissolved	ug/L	1.0	10	Quarterly
COD, Filtered	mg/L	*****	N/A	Quarterly

Explanation of Limits and Monitoring Requirements

Groundwater Monitoring: In accordance with s. NR 214.21(1)(b), Wis. Adm. Code, for absorption pond systems which receive any type of liquid waste and have a flow to the system of 15,000 gallons per day or more, but less than 1.0 million gallons per day, the permittee shall install a single level groundwater monitoring system. This absorption pond system receives an average daily flow of 103,000 gpd and does not yet have a groundwater monitoring system. Therefore, the department is requiring that BRRB install a groundwater monitoring system around the infiltration pond system site.

Groundwater Monitoring Parameters: In accordance with s. NR 214.21(4)(e) and (f), Wis. Adm. Code, the department may require groundwater monitoring for any of the following parameters: elevation, depth to groundwater, organic nitrogen, ammonia nitrogen, nitrate and nitrite nitrogen, chlorides, sulfates, dissolved solids, alkalinity, hardness, field pH, field specific conductance, BOD5, COD, sodium, calcium, magnesium, iron and manganese. Monitoring for any other pollutant parameters may be required on a case-by-case basis dependent on the waste characteristics of the wastewater applied to the land treatment system and the potential for groundwater contamination. Therefore, the department has

include quarterly groundwater monitoring for groundwater elevation, depth to groundwater, organic nitrogen, ammonia nitrogen, nitrate and nitrite nitrogen, TKN, chlorides, dissolved solids, field pH, COD, iron, manganese, and arsenic based on the monitoring data provided in the permit application, types of water treatment systems used at the facility, and plan submittal information for the system.

Preventative Action Limits (PALs) and Enforcement Standards (ESs): The groundwater PALs and ESs are included to determine compliance the groundwater standards found in ch. NR 140, Wis. Adm. Code. For more information, please see the Groundwater Evaluation Memo attached to this fact sheet.

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3 Schedules

3.1 Groundwater Monitoring Well - Installation

Required Action	Due Date
Plans and Specifications: Submit plans and specifications for installation of monitoring wells to be installed around the absorption pond system pursuant to chs. NR 108 and NR 214.21, Wis. Adm. Code.	03/31/2022
Installation: Complete well installation in accordance with chs. NR 141, and NR 214.21, Wis. Admin. Code. (Note: Documentation of well construction must be submitted to the Department within 60 days of well installation.)	09/30/2022

Explanation of Schedule

In accordance with s. NR 214.21(1)(b), Wis. Adm. Code, for absorption pond systems which receive any type of liquid waste and have a flow to the system of 15,000 gallons per day or more, but less than 1.0 million gallons per day, the permittee shall install a single level groundwater monitoring system. This absorption pond system receives an average flow of 103,000 gpd and does not yet have a groundwater monitoring system. Therefore, the department is requiring that BRRB install a groundwater monitoring system around the infiltration pond system site. This schedule is put into the permit to bring the facility into compliance with the requirements of s. NR 214.21(1)(b), Wis. Adm. Code.

Pursuant to s. NR 214.21(2)(c), Wis. Adm. Code, the groundwater monitoring well system shall consist of an adequate number of wells to define groundwater flow direction and to judge the groundwater impacts from land treatment on the site. A background monitoring well shall be located upgradient and far enough away from the land treatment system that no impact from the treatment system is measured. The other monitoring wells shall be located downgradient from the land treatment system in the possible directions of groundwater flow. In the event the groundwater flow direction is not known, the department may require the downgradient wells to be installed approximately equal distance from each other and around the perimeter of the system.

3.2 Groundwater Monitoring Well Site Map Submittal

Required Action	Due Date
Monitoring Well Site Map: Submit a site map in accordance with ss. NR 141.065 and NR 214.21(2)(f), Wis. Adm. Code. The site map/plan shall indicate: 1. The location of the land treatment system, structure boundaries, property boundaries, any nearby surface waters and a north arrow. 2. Show the wells in relation to each other, to property and structure boundaries, and to a common reference point on a horizontal grid system. The origin of the grid system shall be located according to latitude and longitude or according to the state plane coordinate system. 3. The exact vertical location of the top of the casing (TOC) for each well referenced to the nearest benchmark for the national geodetic survey datum to an accuracy of 0.01 feet. 4. The elevation of the TOC for each well. 5. The exact location of the installed well on a horizontal grid system which is accurate to within one foot. 6. Direction of groundwater flow. 7. The calculated ground surface elevation for each well. Land surface contours of the land treatment system and the elevations of the groundwater shall be referenced to the U.S. geological survey or the U.S. national geodetic survey.	12/31/2022

Explanation of Schedule

In accordance with ss. NR 141.065 and NR 214.21(2)(f), Wis. Adm. Code, an as-built plan map shall be submitted specifying the exact vertical and horizontal location of the wells. All monitoring well locations shall be reported to the department on a plan map drawn to a specific scale.

3.3 Groundwater Monitoring Well System Testing

Required Action	Due Date
<p>Monitoring Well System Testing: The permittee shall test the groundwater monitoring wells after installation to provide information on the hydrogeology of the site pursuant to s. NR 214.21(2)(e), Wis. Adm. Code. The testing shall include the following information:</p> <ol style="list-style-type: none">1. The saturated hydraulic conductivity of the aquifer around at least 3 of the monitoring wells estimated by performing in-field tests. All preparation work, analysis and information describing the use of the in-field test shall be submitted along with the results obtained. The test shall be of sufficient duration and include enough data to provide a representative estimate of the actual hydraulic conductivity.2. The horizontal and, if possible, the vertical hydraulic gradient calculated using measured groundwater elevations from on-site wells.3. The aquifer thickness and type of bedrock determined through use of reliable reference material or by actual measurement.	12/31/2022

Explanation of Schedule

In accordance with s. NR 214.21(2)(e), Wis. Adm. Code, the groundwater monitoring wells shall be tested to provide information on the hydrogeology of the site.

3.4 Land Treatment Annual Report

Required Action	Due Date
Annual Land Treatment Report #1: Submit the Annual Land Treatment Report by January 31st for the previous calendar year.	01/31/2021
Annual Land Treatment Report #2: Submit the Annual Land Treatment Report by January 31st for the previous calendar year.	01/31/2022
Annual Land Treatment Report #3: Submit the Annual Land Treatment Report by January 31st for the previous calendar year.	01/31/2023
Annual Land Treatment Report #4: Submit the Annual Land Treatment Report by January 31st for the previous calendar year.	01/31/2024
Annual Land Treatment Report #5: Submit the Annual Land Treatment Report by January 31st for the previous calendar year.	01/31/2025
Annual Land Treatment Report After Permit Expiration: In the event that this permit is not reissued on time, the permittee shall continue to submit annual land treatment reports by January 31st each year.	

Explanation of Schedule

The annual land treatment reports as a schedule in the permit allows for an electronic reminder of the due date each year. The requirement of the annual report for the outfall is included as a table in the “Land Treatment Requirements” section of the permit pursuant to s. NR 214.12(4), Wis. Adm. Code.

3.5 Land Treatment Management Plan

A management plan is required for the land treatment systems pursuant to ch. NR 214, Wis. Adm. Code.

Required Action	Due Date
Land Treatment Management Plan: Submit update to the management plan to optimize the absorption pond system performance and demonstrate compliance with s. NR 214.12, Wis. Adm. Code.	03/31/2023

Explanation of Schedule

Section NR 214.12(5)(b), Wis. Adm. Code, requires that the owner or operator of an absorption pond system submit a management plan for optimizing treatment system performance and to demonstrate compliance with the requirements of ch. NR 214, Wis. Adm. Code, to the department for approval. BRRB has indicated that they have a management plan for the infiltration pond system. Therefore, the department is requiring that BRRB submit an updated management plan to demonstrate compliance with this permit and s. NR 214.12, Wis. Adm. Code.

3.6 Permit Application Submittal

The permittee shall file an application for permit reissuance in accordance with ch. NR 200, Wis. Adm. Code.

Required Action	Due Date
Permit Application Submittal: Submit a complete permit application to the Department no later than 180 days prior to the permit expiration date.	04/01/2025

Explanation of Schedule

The permittee shall file an application for permit reissuance in accordance with s. NR 200.06(1), Wis. Adm. Code. This section serves as a reminder of the due date of the reissuance permit application.

4 Standard Requirements

Explanation of Standard Requirements

Standard Requirements section contains conditions and requirements that are, for the most part, applicable to all industrial permittees. These requirements are based on general conditions found in s. NR 205.07(1) and (3), Wis. Adm. Code. Other requirements relating to land treatments systems in this section come from ss. NR 214.12-16, Wis. Adm. Code.

Operation certification requirements have been removed. BRRB is excluded from operator certification in ch. NR 114, Wis. Adm. Code. as the industrial wastewater treatment consists solely of a land disposal system pursuant to s. NR 114.52(22)(c), Wis. Adm. Code.

Attachments:

Groundwater Evaluation

Facility Site Map

Water Flow Diagram

Prepared By:

Trevor Moen
Wastewater Engineer
Bureau of Water Quality

Date: 08/12/2020

DATE: July 28, 2020

FILE REF: 3400

TO: File

FROM: Woody Myers - WCR

SUBJECT: Big River Resources LLC - Groundwater Evaluation Report, WPDES Permit # WI-0066664-01-0

Groundwater Evaluation Summary

Site Information

The Big River resources LLC facility is located at N10185 370th Street, Boyceville, Dunn County. This is an industrial facility. Wastewater will be discharged to groundwater via absorption ponds (seepage cells). The land treatment systems are located in the NE ¼ of the SE ¼ of Section 29, T30N, R13W, Town of Hay River.

Geology

The bedrock under this facility is the Eau Claire Formation. This formation consists of poorly sorted fine-grained sandstone with intermixed glauconite. Depth to bedrock is anticipated to be approximately 50 feet below ground surface (bgs). The surface soils have been identified as the Plainfield loamy sand and Prissel loamy sand.

Hydrology

Depth to groundwater is assumed to be less than 20 feet bgs. Local groundwater is assumed to flow to the north toward Hay River. This is consistent with the regional groundwater flow direction. This facility is approximately 2,100 feet south of the South Fork Hay River. There are multiple high capacity and private wells within a 1,000-foot radius.

Discharge Outfalls

These are two active outfalls for this facility. Outfall 001 is the outfall the groundwater monitoring network relate to.

Sampling Point (Outfall) Listed in SWAMP		
Number	Outfall Type	Description
Outfall 001	Land Treatment	Seepage Cells
Outfall 002	Land Treatment	Ground Surface

Proposed Groundwater Monitoring Requirements

The groundwater monitoring wells; 801, 802 and 803 (Not currently installed) should be sampled quarterly for the parameters in the table below. The groundwater limits were not calculated due to the proposed installation of the wells. A determination of the well position, standard use and potential PALS and ACLs will be evaluated prior to the next permit issuance.

A plan must be submitted to the department to confirm the well location and construction. Once these wells are installed, they need to be sampled monthly to get a baseline per permit.

Proposed Groundwater Standards –Permit WI-0066664-01-0

Parameter	PAL	ES	Source
Depth to Groundwater	N/A	N/A	Measured
Groundwater Elevation	N/A	N/A	Measured
Chloride	125 mg/l	250 mg/l	Table 2, NR 140
Nitrogen, Nitrite + Nitrate	2.0 mg/l	10.0 mg/l	Table 1, NR 140
pH	5.0-9.0 su	N/A	Measured
Nitrogen, Ammonia	0.97 mg/l	9.7 mg/l	Table 1, NR 140
Nitrogen, Organic	*****	N/A	Measured
Total Kjeldahl Nitrogen	*****	N/A	Measured
Total Dissolved Solids	*****	N/A	Measured
COD	*****	N/A	Measured
Iron, Dissolved	0.15 mg/l	0.3 mg/l	Table 2, NR 140
Manganese	60 µg/l	300 µg/l	Table 1, NR 140
Arsenic, Dissolved	1 µg/l	10 µg/l	Table 1, NR 140

All of these parameters are analyzed for the aqueous or dissolved phase in groundwater. Established groundwater quality standards are found in s. NR 140.10 Table 1 Public Health Groundwater Quality Standards, and NR 140.12 Table 2 Public Welfare Groundwater Standards. The thresholds of these standards are the Enforcement Standard (ES) and the PAL.

Conclusions

Given the anticipated hydraulic loading, the location of the land treatment systems in relation to groundwater and the effluent concentrations of the wastewater submitted in the General Permit monitoring reports; it is the departments direction per ch. NR 214.20 Wis. Adm. Code that a simple groundwater monitoring system be installed.

This is the first issuance of the permit for this facility. Calculations for the s. NR140.20 Table 3 Indicator Parameters and the potential for NR 140.10 and 140.12 Tables 1 and 2 ACLs can be evaluated after 8 rounds of data have been collected. The PALs and ACLs will be based on the background groundwater quality. This is typically conducted during the groundwater evaluation prior to permit reissuance.

Compliance Schedule

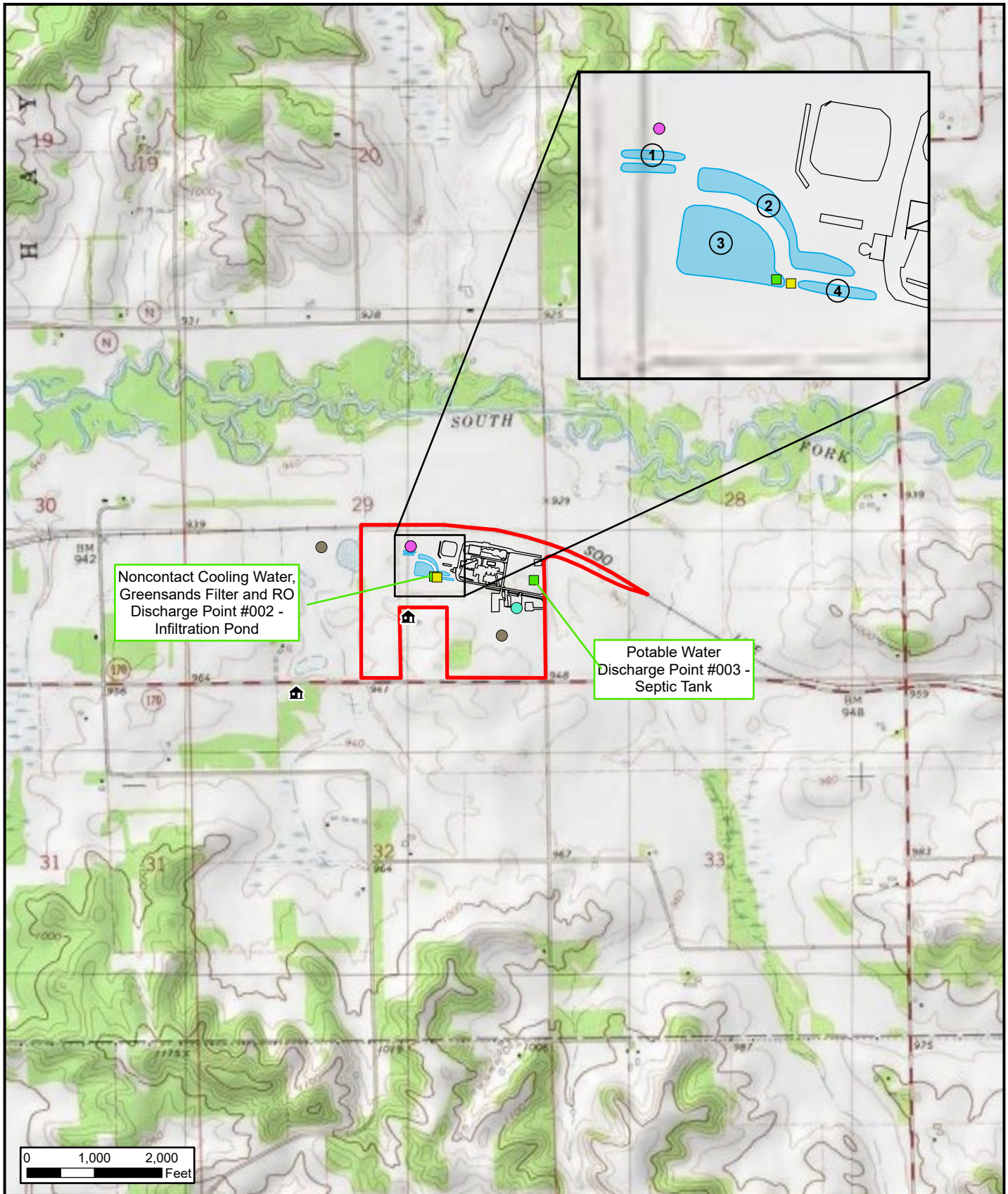
A plan must be submitted to the department with the details of the ch. NR 214.20 Wis. Adm. Code groundwater monitoring system to the Plan review section prior to the well installation.

After installation, the groundwater monitoring wells should be surveyed per ch. NR 141, Wis. Adm. Code. The new survey should include the elevation of the top of casing (TOC) for the wells and a calculated ground surface elevation.

A map is required of the land treatment system per ch. NR 141.065 Wis. Adm. Code.

“All monitoring well locations shall be reported to the department on a plan map drawn to a specific scale. The map shall indicate structure boundaries, property boundaries, any nearby surface waters and a north arrow. The plan shall show the wells in relation to each other, to property and structure boundaries and to a common reference point on a horizontal grid system. The origin of the grid system shall be

located according to latitude and longitude or according to the state plane coordinate system. The exact vertical location of the top of the well casing shall be referenced to the nearest benchmark for the national geodetic survey datum to an accuracy of 0.01 feet. This plan map shall show the exact location of the installed well on a horizontal grid system which is accurate to within 1 foot.”

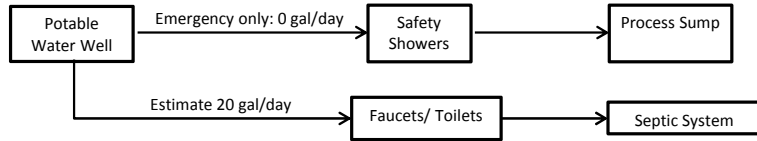


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|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> Residence Discharge Location WPDES Sampling Location #001 Site Boundary | <ul style="list-style-type: none"> Facility Wells/Water Intakes Non-Potable Private Private Potable Transient Non-Community | <ul style="list-style-type: none"> Storm Water Infiltration Basin Storm Water Pond Infiltration Pond Settling Pond |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Figure 1
Big River Resources Boyceville, LLC
 Boyceville, Wisconsin



Potable Water System



Process Water System

